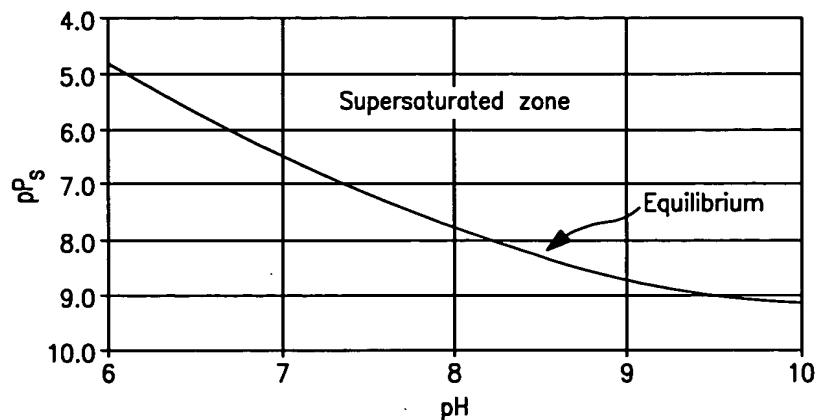


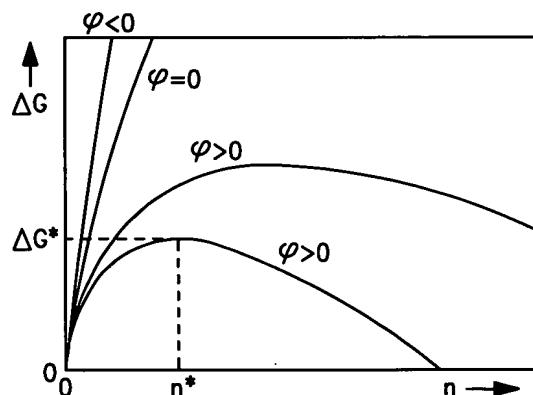
Title: APPARATUS AND METHOD FOR
REMOVING PHOSPHORUS FROM
WASTE LAGOON EFFLUENT

Applicant: Bowers et al.
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Atty Docket: 297/181



Variation of Equilibrium Conditional Solubility versus pH for Struvite
(from Ohlinger et al., 1998)

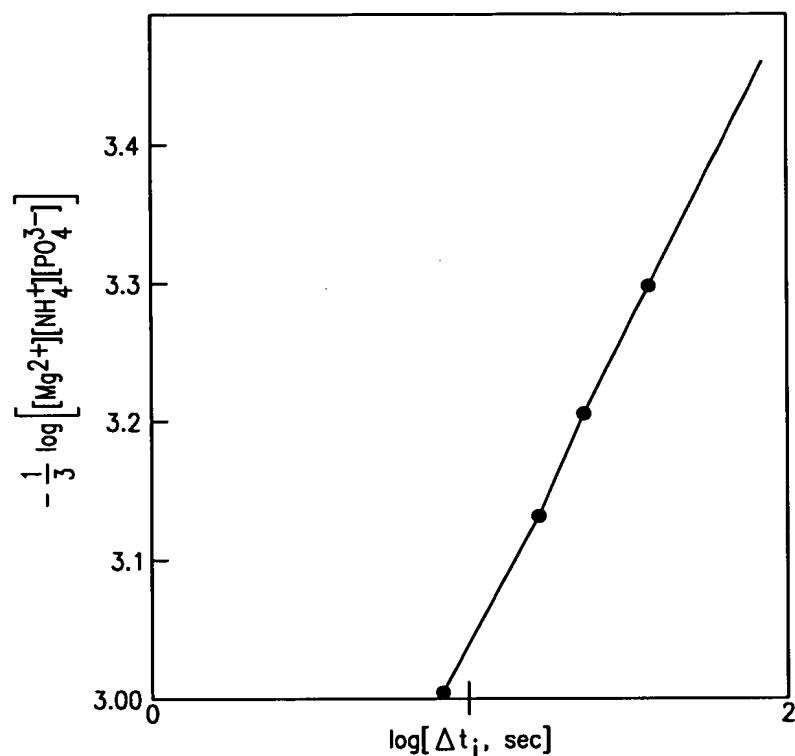
FIG. 1



Free Energy versus Number of Particles in a Precipitating Crystal

FIG. 2

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REMOVING PHOSPHORUS FROM
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Concentration ($-1/3 \log$ of Ionic Product, Mol/L) versus Induction Time (Sec) for
Struvite Precipitation

FIG. 3

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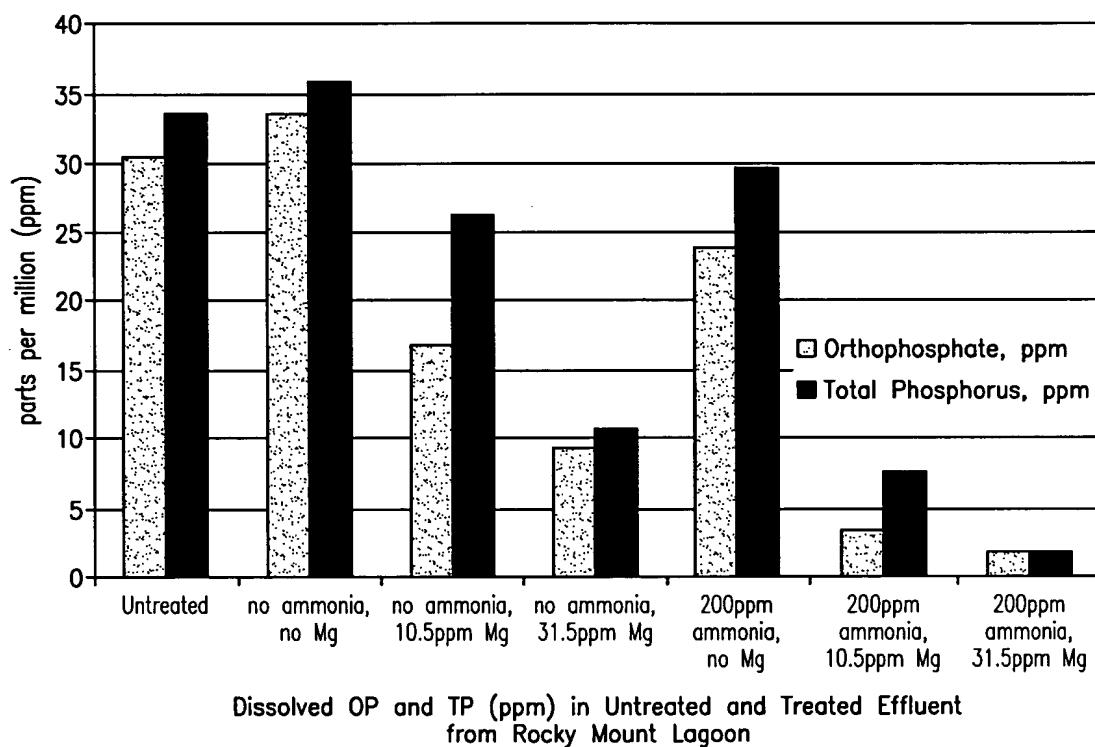


FIG. 4

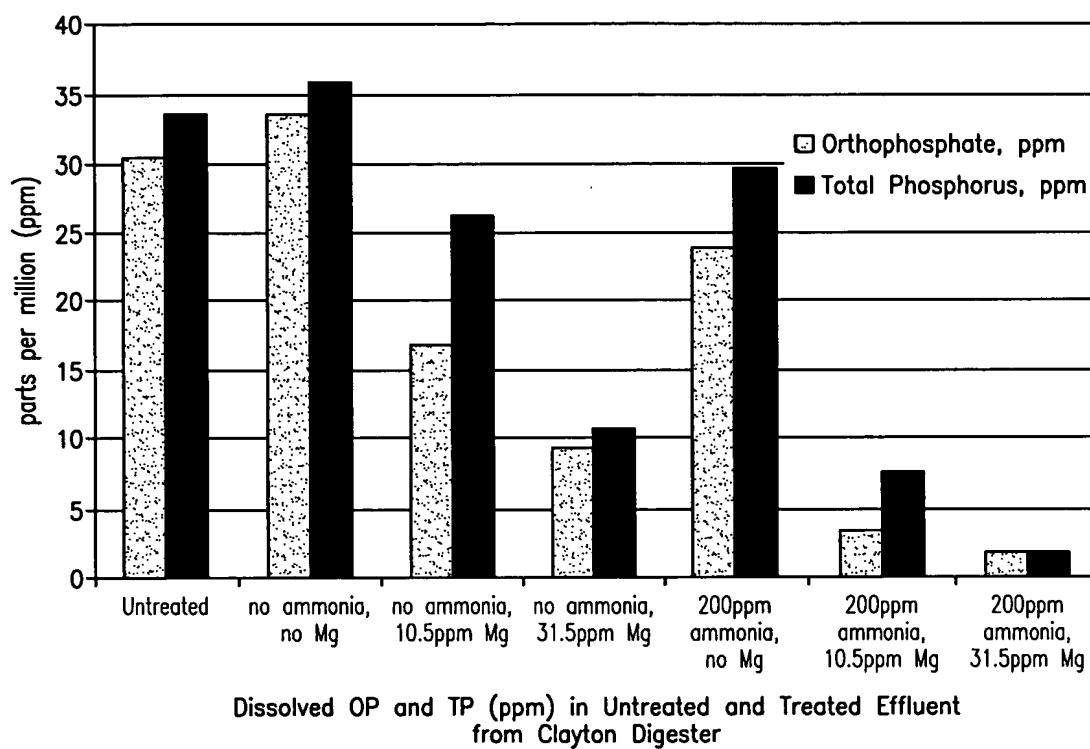


FIG. 5

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Applicant: Bowers et al.

Serial No.: 10/659,239

Atty Docket: 297/181

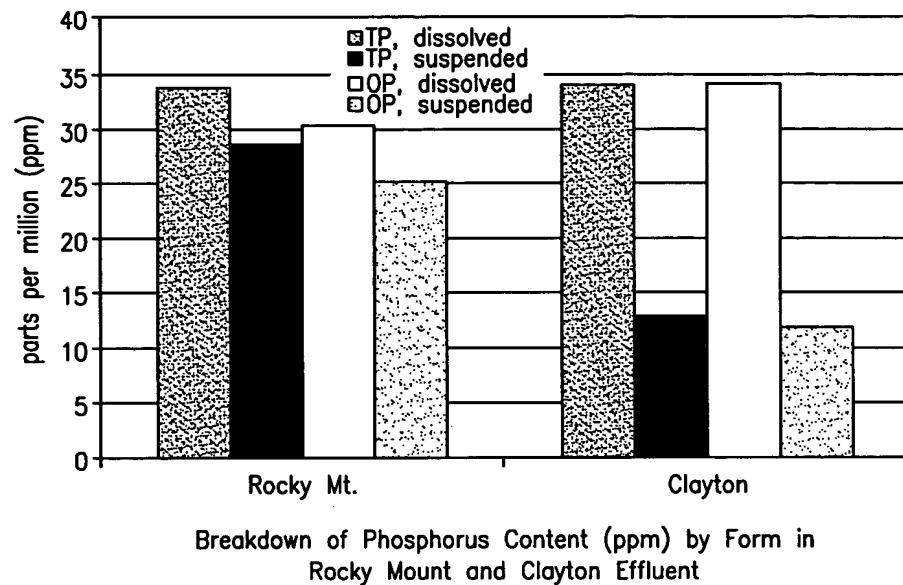


FIG. 6

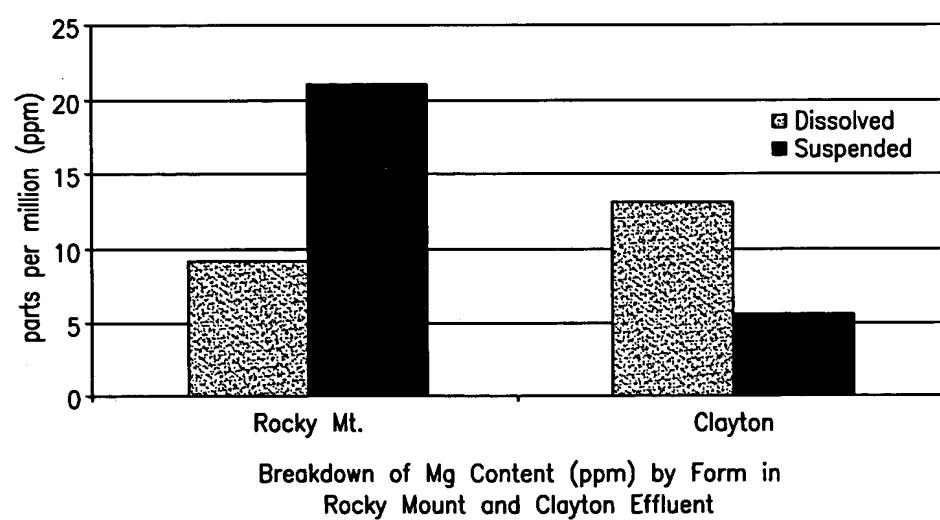


FIG. 7

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WASTE LAGOON EFFLUENT

Applicant: Bowers et al.
Serial No.: 10/659,239
Atty Docket: 297/181

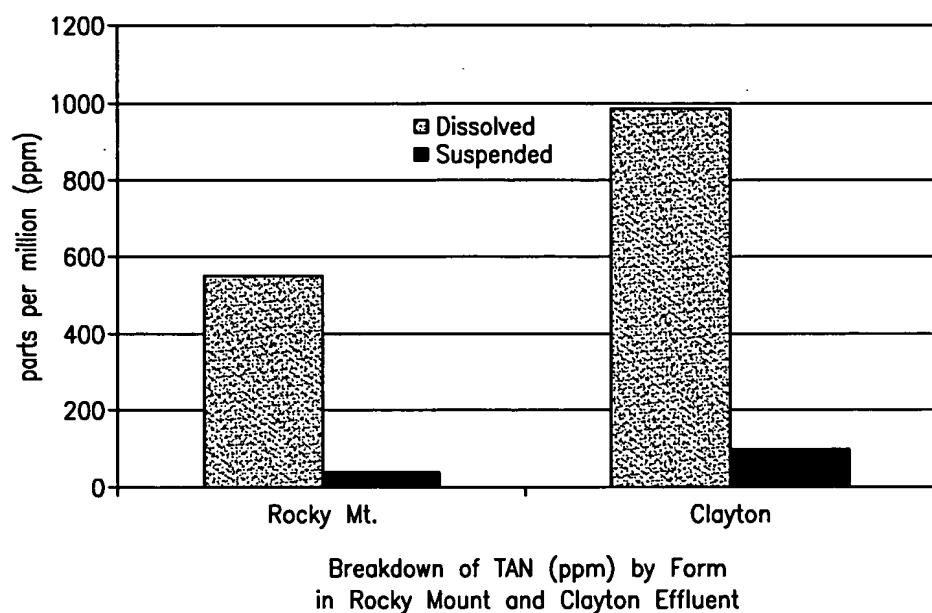


FIG. 8

Title: APPARATUS AND METHOD FOR
REMOVING PHOSPHORUS FROM
WASTE LAGOON EFFLUENT
Applicant: Bowers et al.
Serial No.: 10/659,239
Atty Docket: 297/181

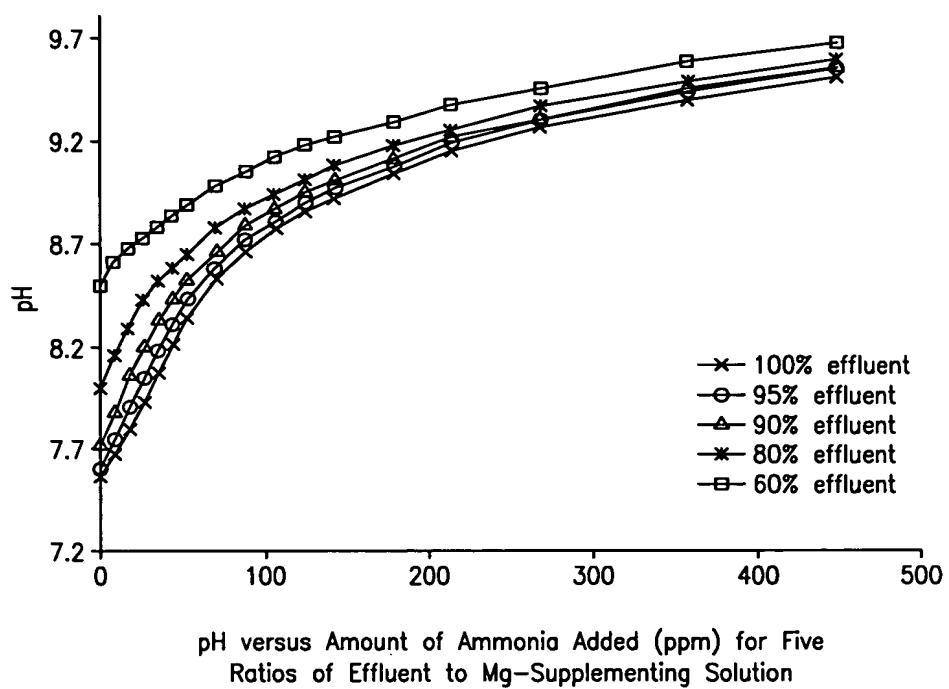


FIG. 9

Title: APPARATUS AND METHOD FOR
REMOVING PHOSPHORUS FROM
WASTE LAGOON EFFLUENT

Applicant: Bowers et al.
Serial No.: 10/659,239
Atty Docket: 297/181

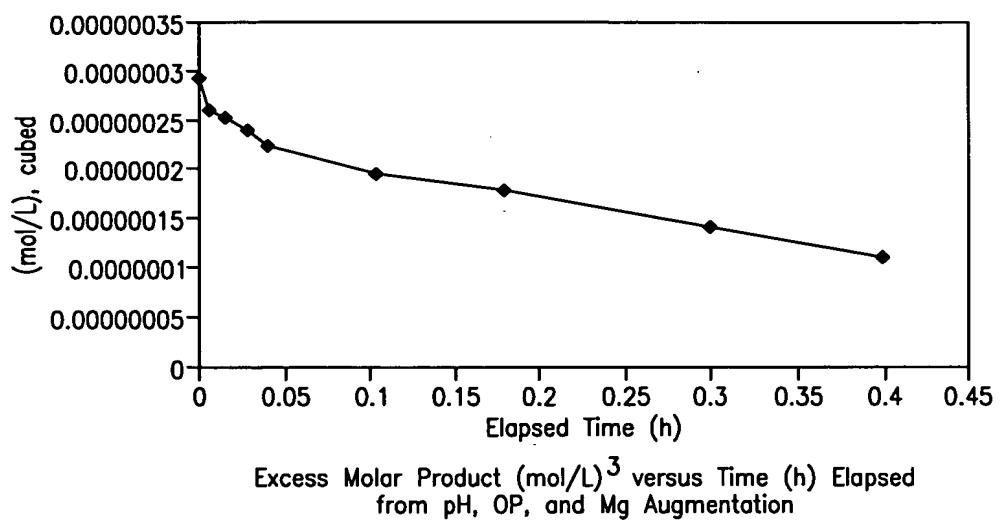
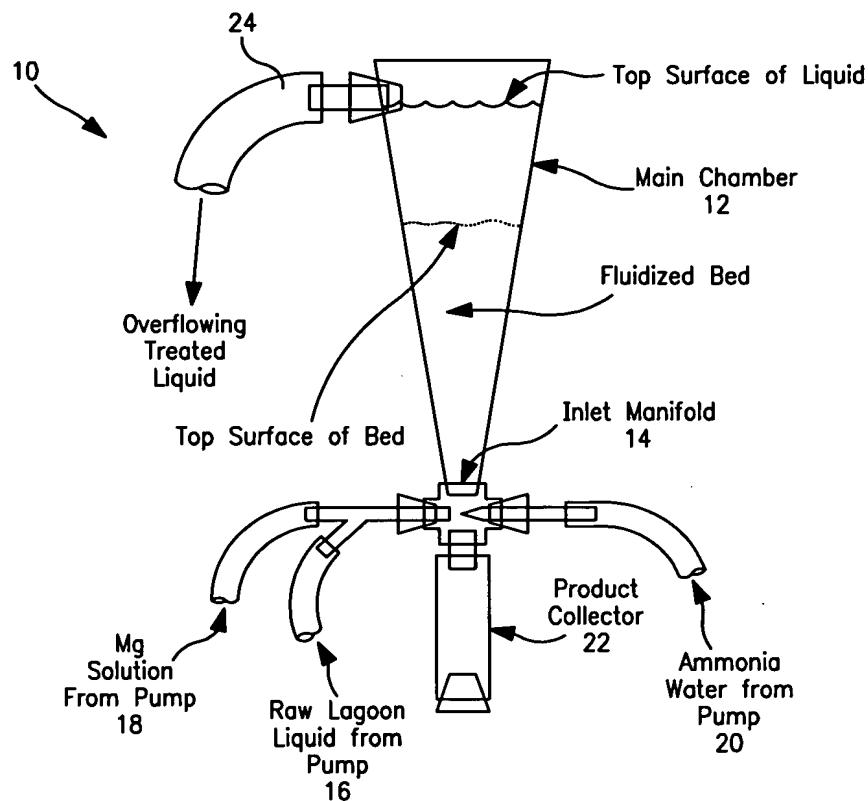


FIG. 10

Title: APPARATUS AND METHOD FOR
REMOVING PHOSPHORUS FROM
WASTE LAGOON EFFLUENT
Applicant: Bowers et al.
Serial No.: 10/659,239
Atty Docket: 297/181



Sketch of Laboratory-Scale Continuous Crystallizer

FIG. 11

Title: APPARATUS AND METHOD FOR
REMOVING PHOSPHORUS FROM
WASTE LAGOON EFFLUENT

Applicant: Bowers et al.

Serial No.: 10/659,239

Atty Docket: 297/181

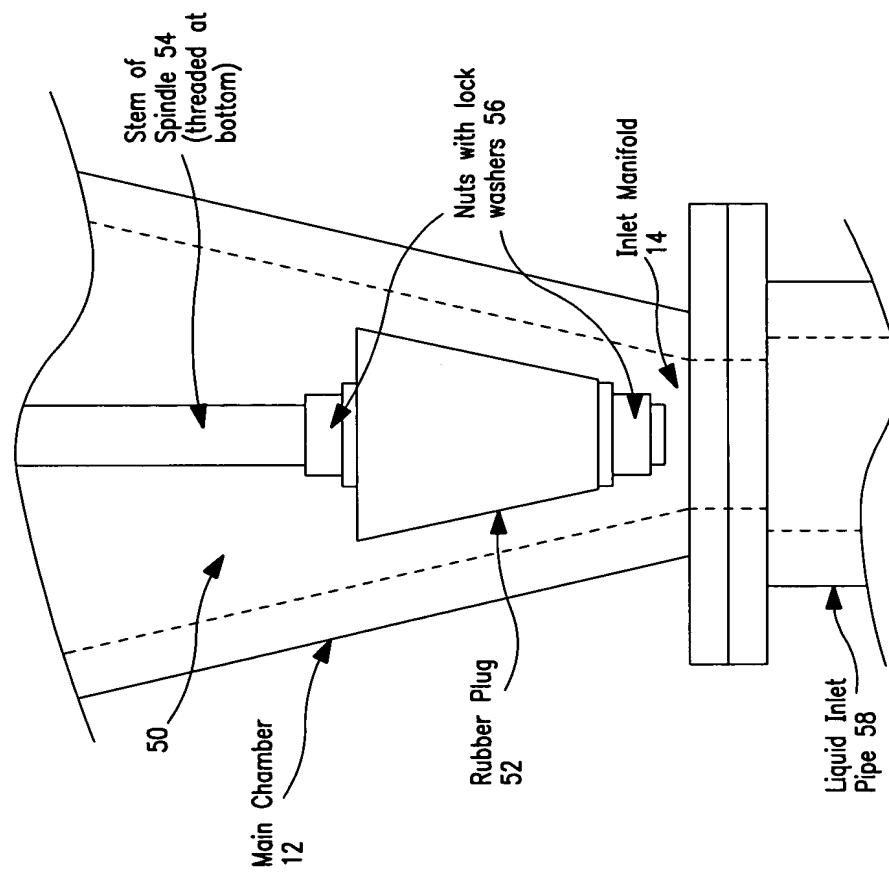
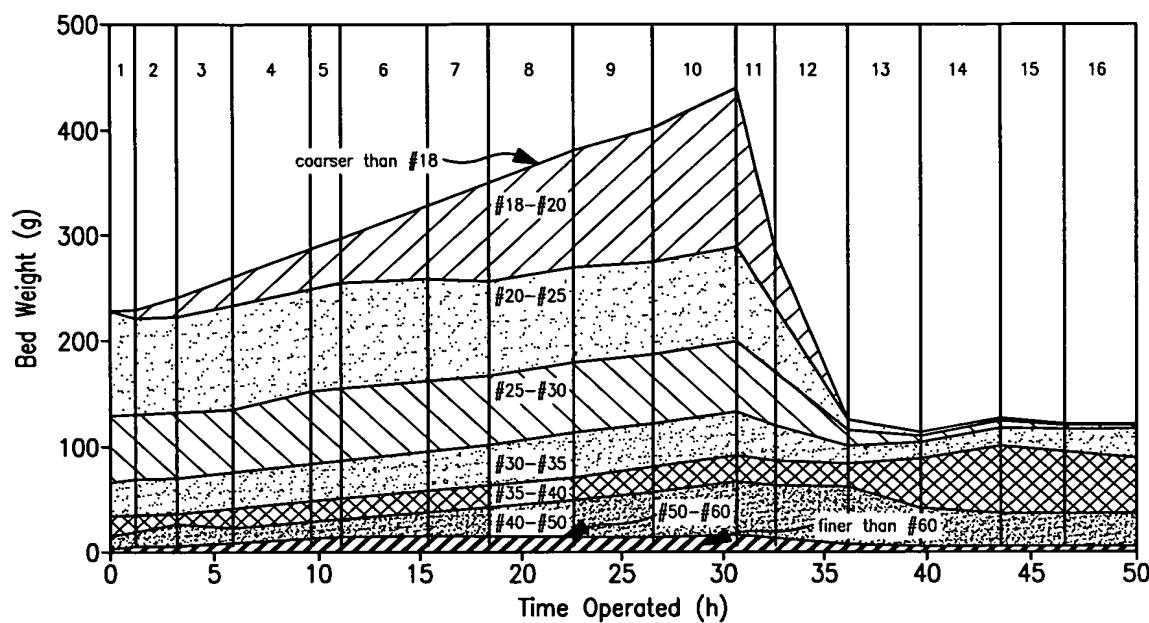
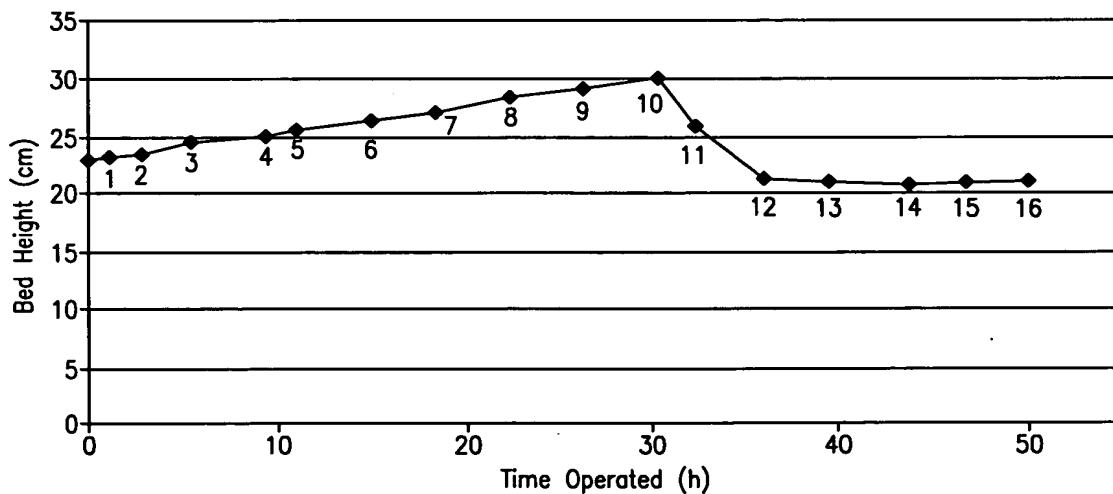


FIG. IIA



First Series of FCRs: Bed Weight (g), Broken Down by
Particle Size (Standard Sieve), vs. Time Operated (h)
(Numbered Vertical Strips Correspond with Runs)

FIG. 12

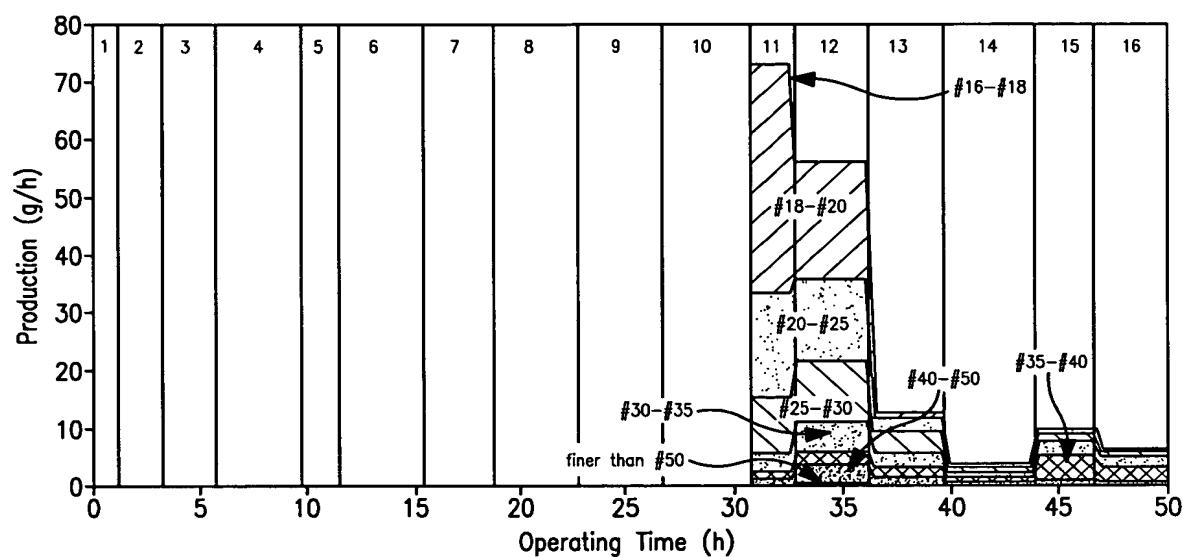


First Series of FCRs: Bed Height (cm) at End of Run
vs. Operating Time (h)
(Run Numbers Indicated)

FIG. 13

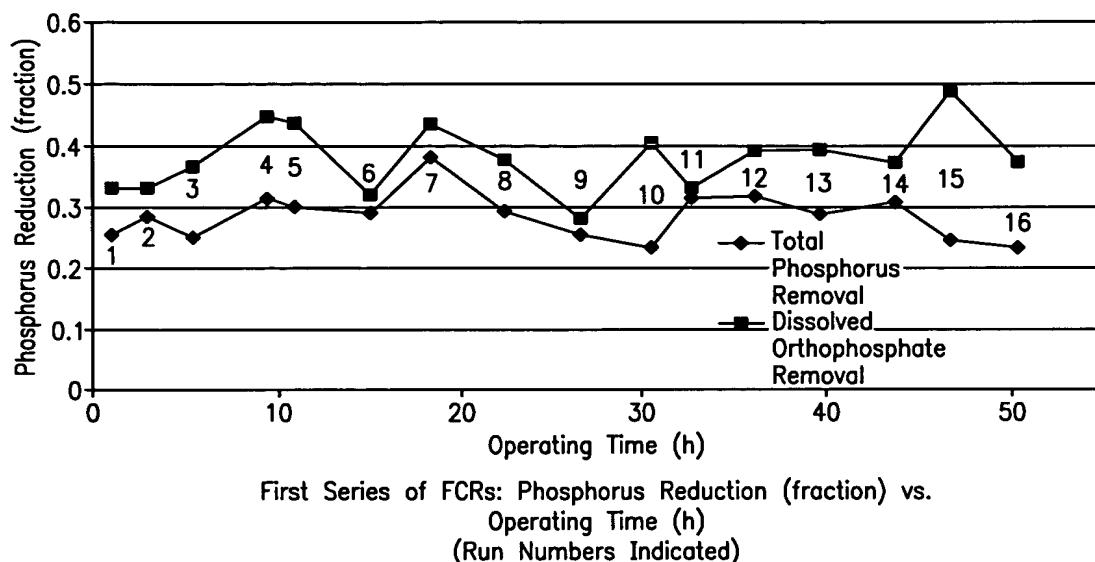
Title: APPARATUS AND METHOD FOR
REMOVING PHOSPHORUS FROM
WASTE LAGOON EFFLUENT

Applicant: Bowers et al.
Serial No.: 10/659,239
Atty Docket: 297/181



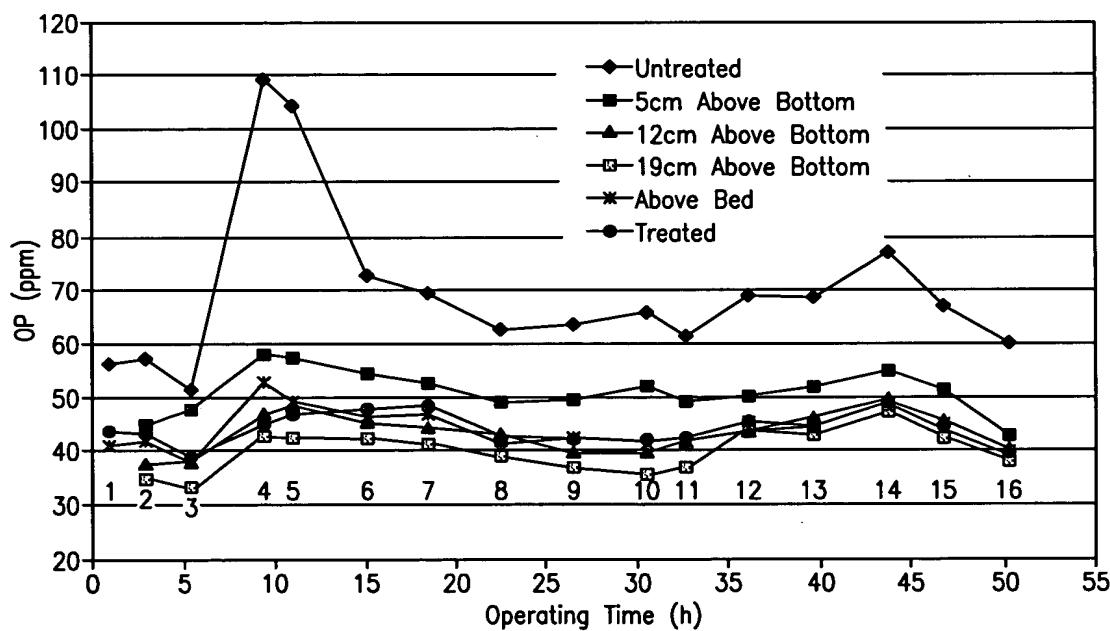
First Series of FCRs: Production (g/h), Averaged Over Each Run,
Broken Down by Particle Size (Standard Sieve)
(Numbered Vertical Strips Correspond with Runs)

FIG. 14



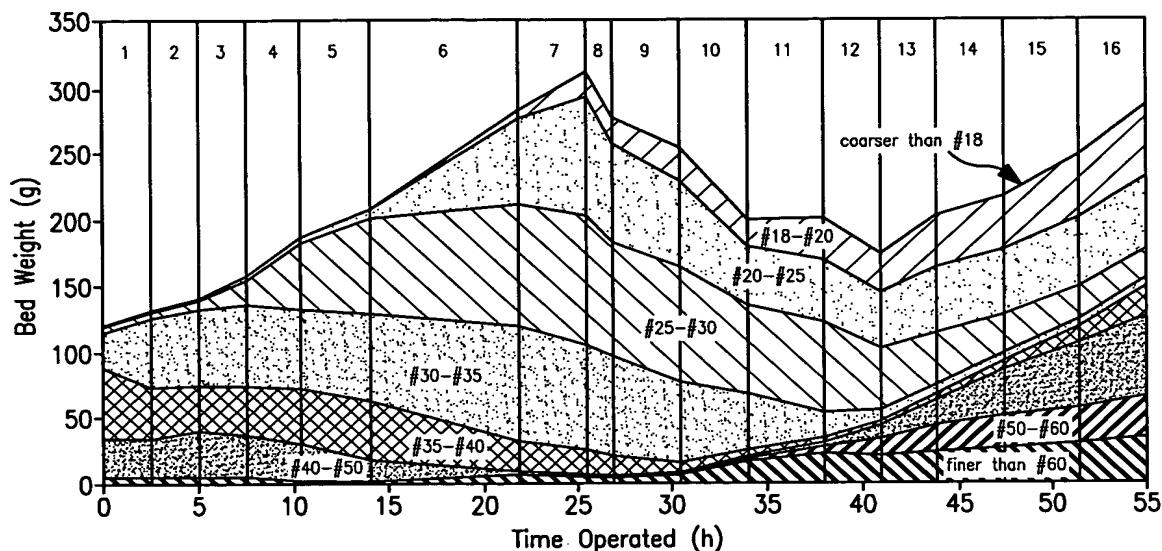
First Series of FCRs: Phosphorus Reduction (fraction) vs.
Operating Time (h)
(Run Numbers Indicated)

FIG. 15



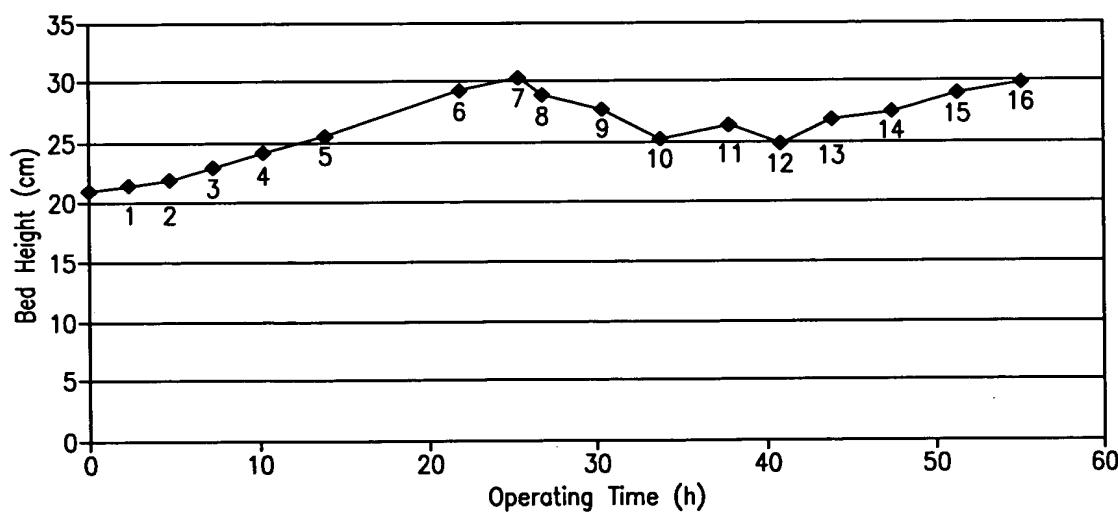
First Series of FCRs: OP (ppm) at Various Sampling Points
vs. Operating Time (h)
(Run Numbers Indicated)

FIG. 16



Second Series of FCRs: Bed Weight (g), Broken Down by
Particle Size (Standard Sieve), vs. Time Operated (h)
(Numbered Vertical Strips Correspond with Runs)

FIG. 17

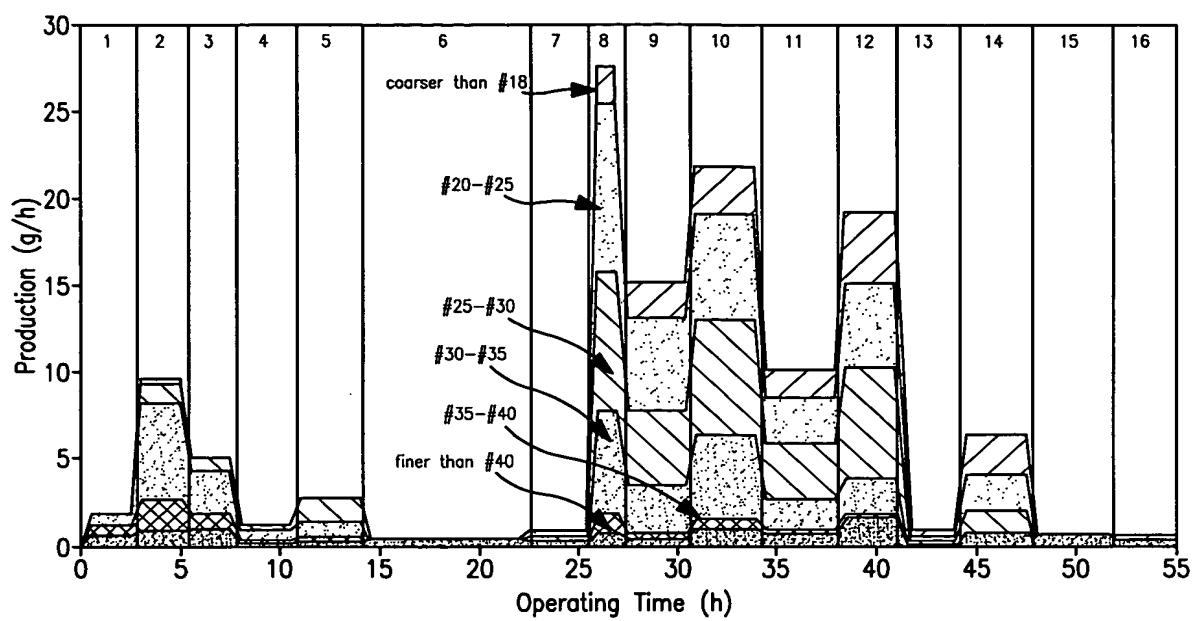


Second Series of FCRs: Bed Height (cm) at End of Run
vs. Operating Time (h)
(Run Numbers Indicated)

FIG. 18

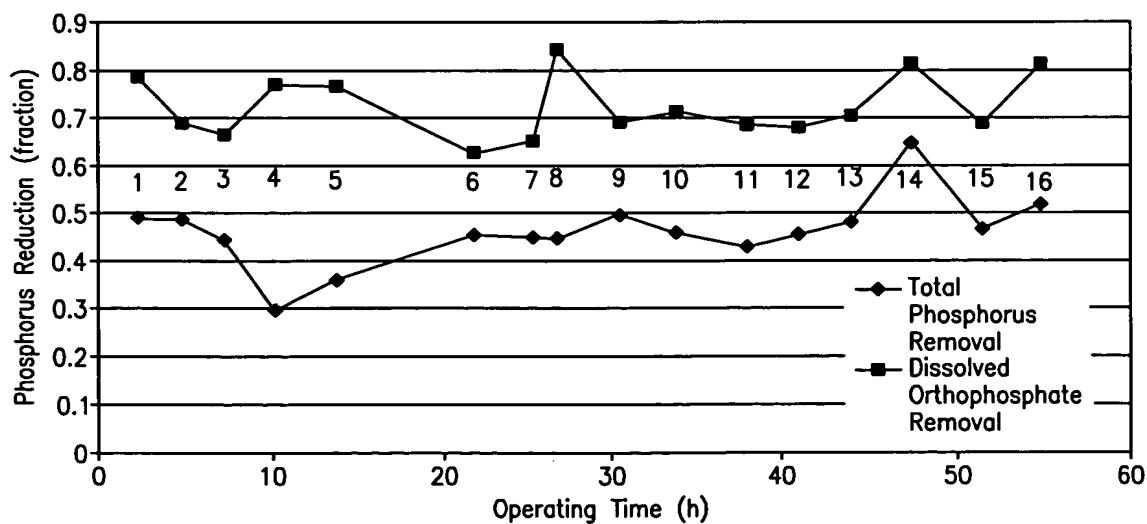
Title: APPARATUS AND METHOD FOR
REMOVING PHOSPHORUS FROM
WASTE LAGOON EFFLUENT

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Second Series of FCRs: Production (g/h), Averaged Over Each Run,
Broken Down by Particle Size (Standard Sieve)
(Numbered Vertical Strips Correspond with Runs)

FIG. 19



Second Series of FCRs: Phosphorus Reduction (fraction) vs.
Operating Time (h)
(Run Numbers Indicated)

FIG. 20

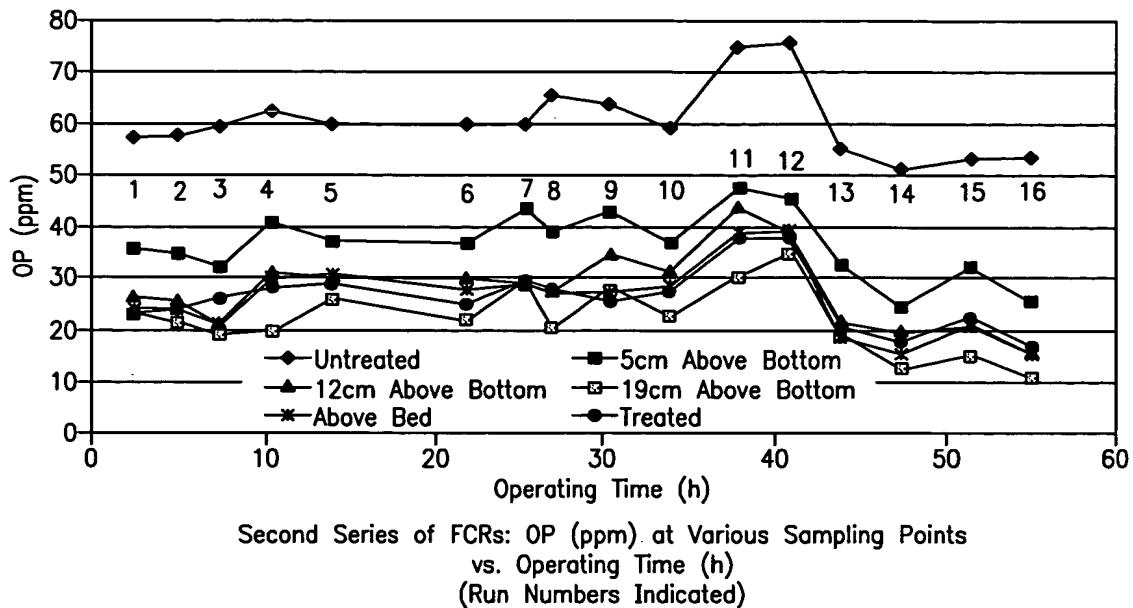
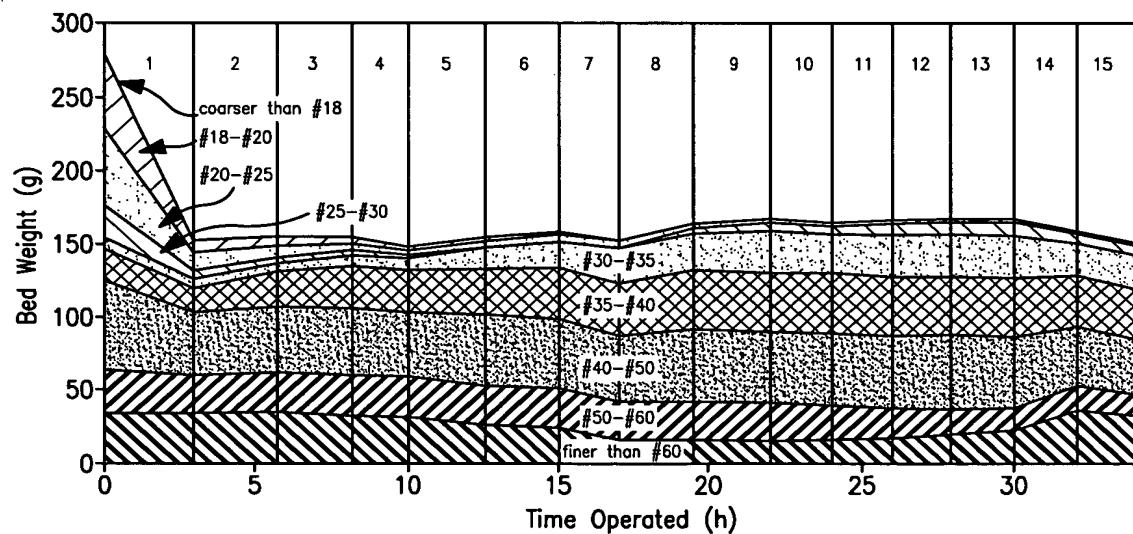


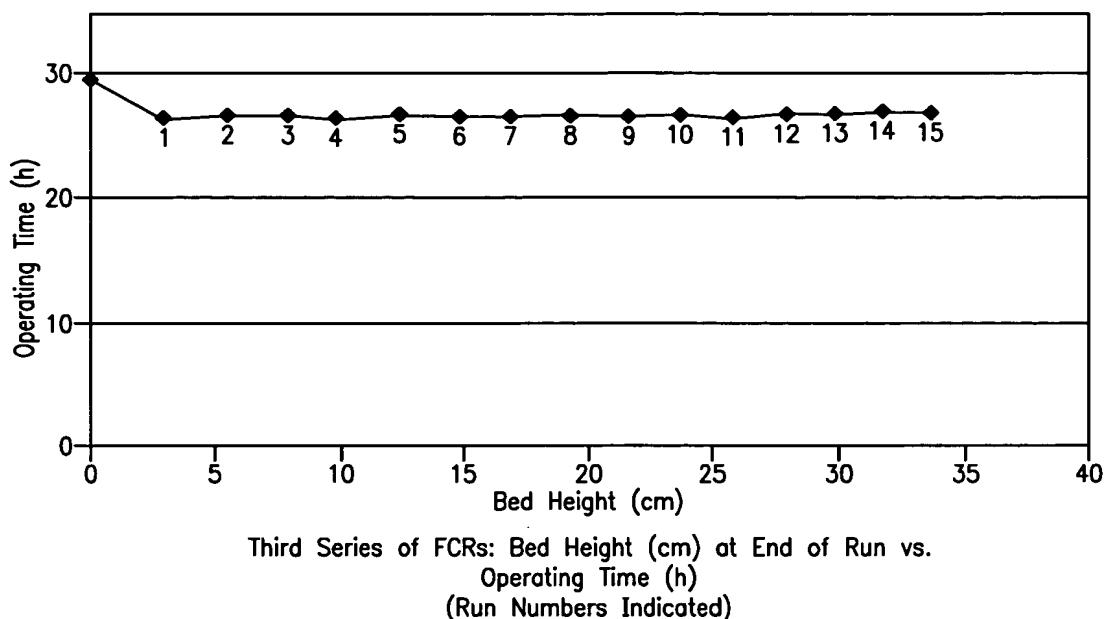
FIG. 21



Third Series of FCRs: Bed Weight (g), Broken Down by
Particle Size (Standard Sieve), vs. Time Operated (h)
(Numbered Vertical Strips Correspond with Runs)

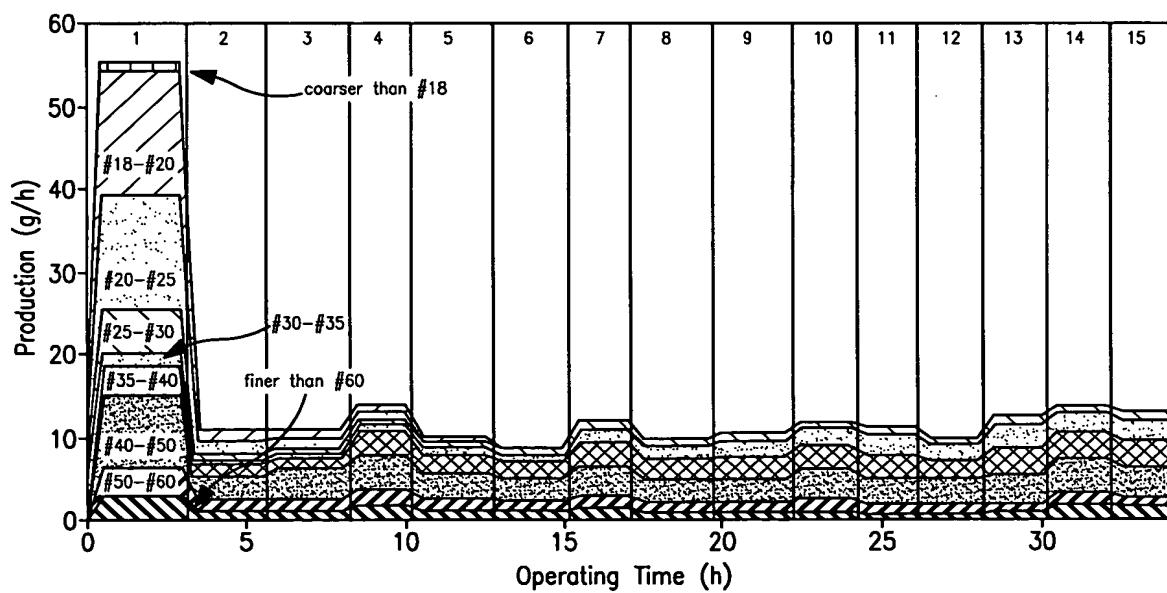
FIG. 22

Title: APPARATUS AND METHOD FOR
REMOVING PHOSPHORUS FROM
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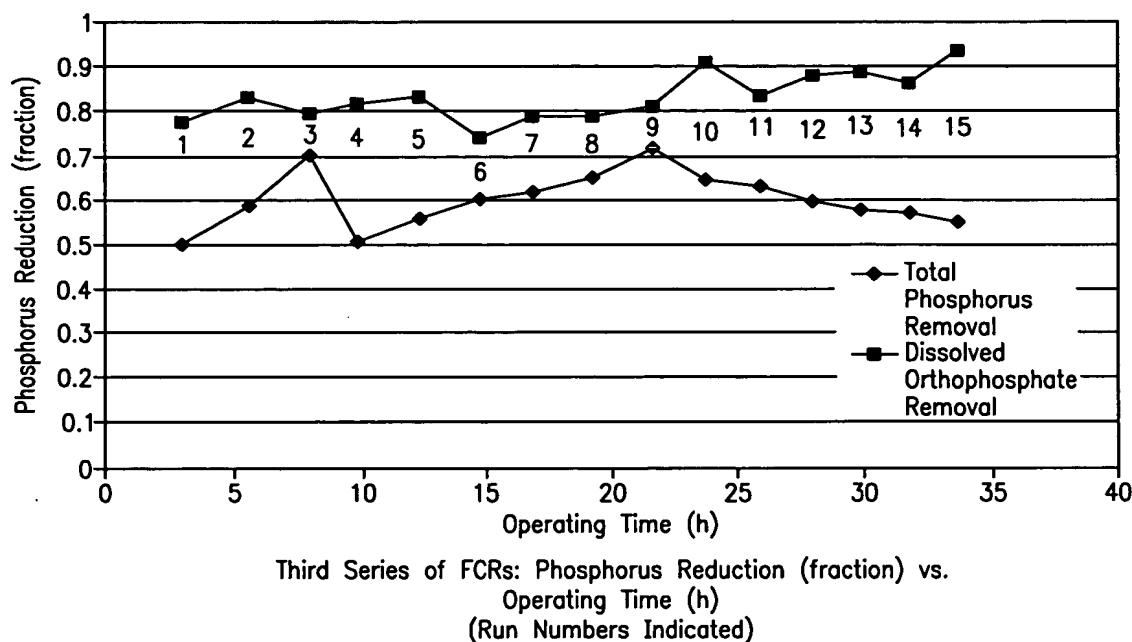
Third Series of FCRs: Bed Height (cm) at End of Run vs.
Operating Time (h)
(Run Numbers Indicated)

FIG. 23



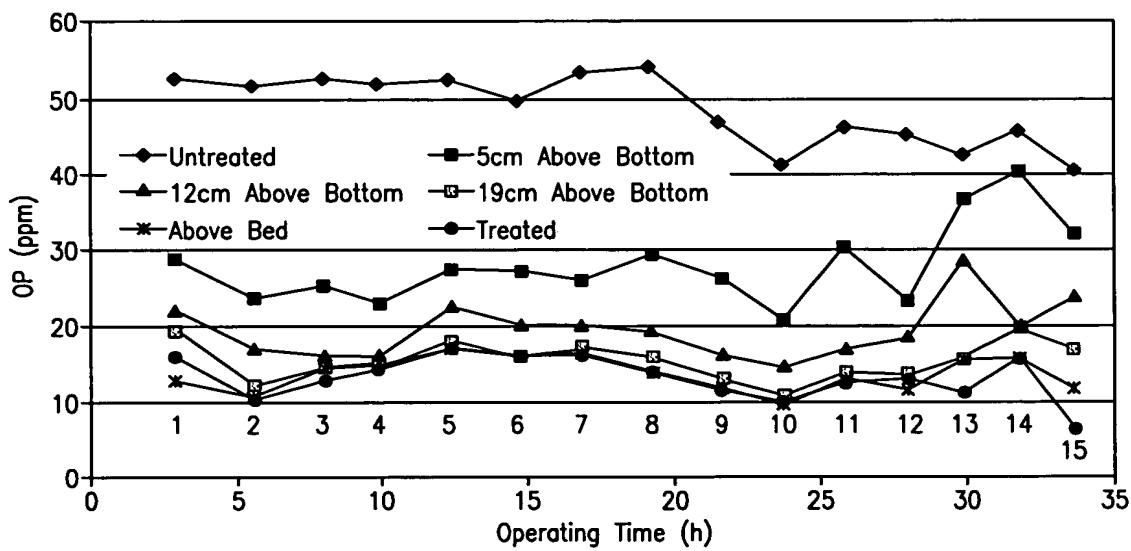
Third Series of FCRs: Production (g/h), Averaged Over Each Run,
Broken Down by Particle Size (Standard Sieve)
(Numbered Vertical Strips Correspond with Runs)

FIG. 24



Third Series of FCRs: Phosphorus Reduction (fraction) vs.
Operating Time (h)
(Run Numbers Indicated)

FIG. 25



Third Series of FCRs: OP (ppm) at Various Sampling Points
vs. Operating Time (h)
(Run Numbers Indicated)

FIG. 26

Title: APPARATUS AND METHOD FOR
REMOVING PHOSPHORUS FROM
WASTE LAGOON EFFLUENT

Applicant: Bowers et al.
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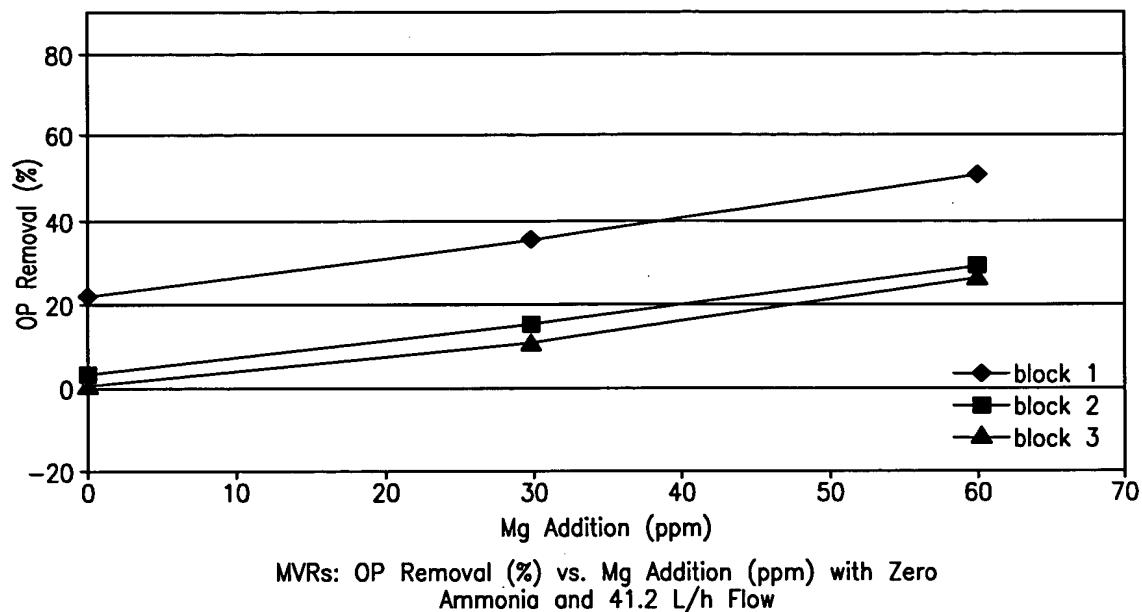


FIG. 27

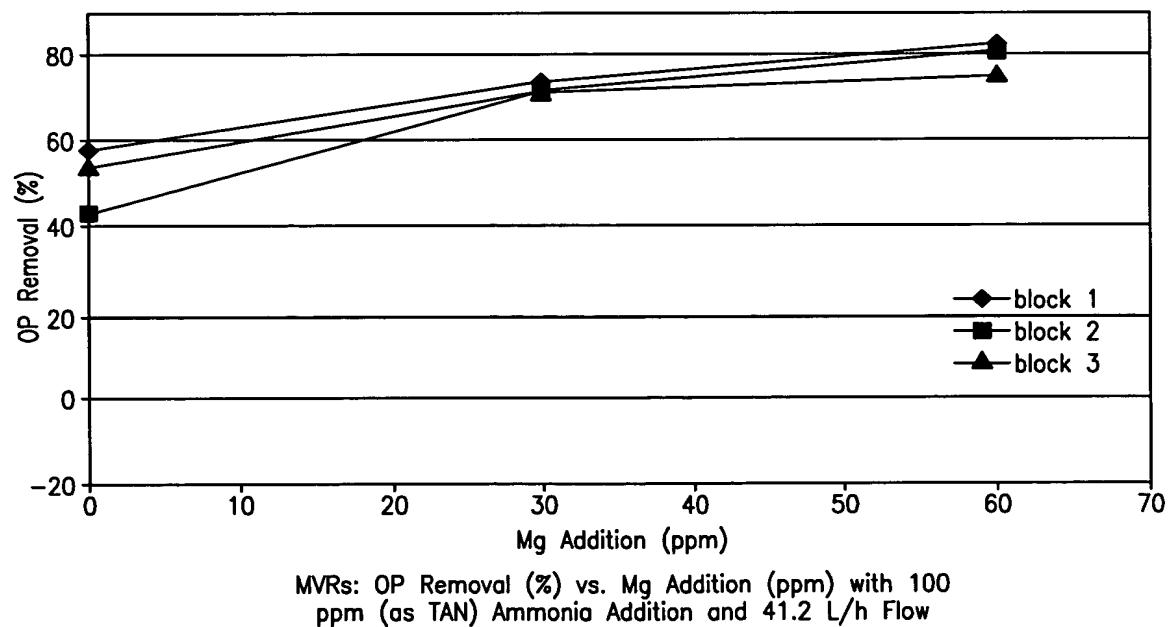


FIG. 28

Title: APPARATUS AND METHOD FOR
REMOVING PHOSPHORUS FROM
WASTE LAGOON EFFLUENT

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Serial No.: 10/659,239

Atty Docket: 297/181

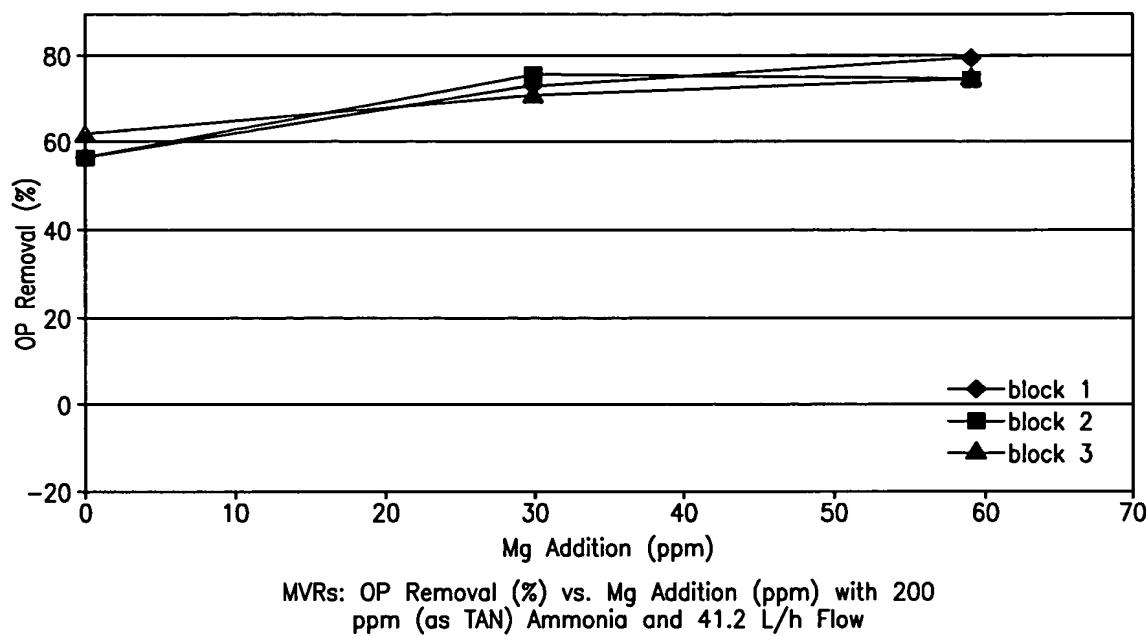


FIG. 29

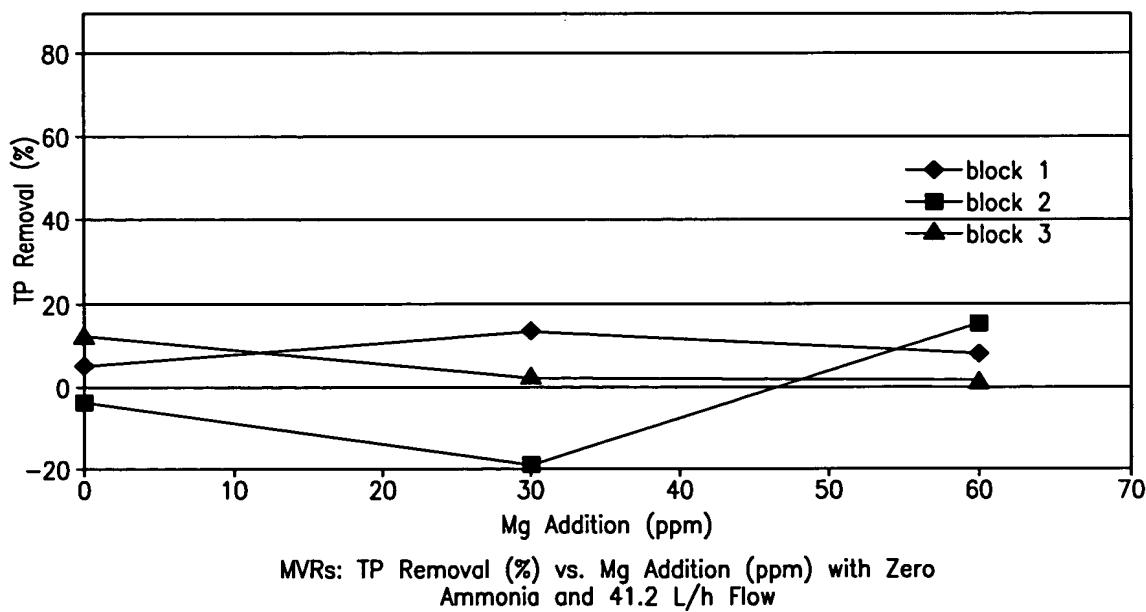
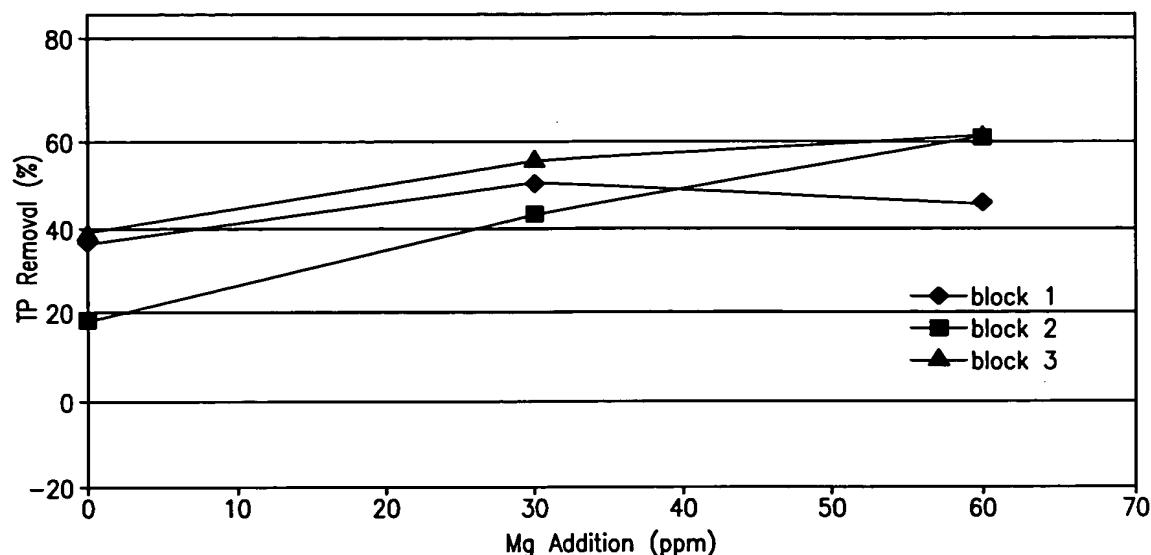


FIG. 30

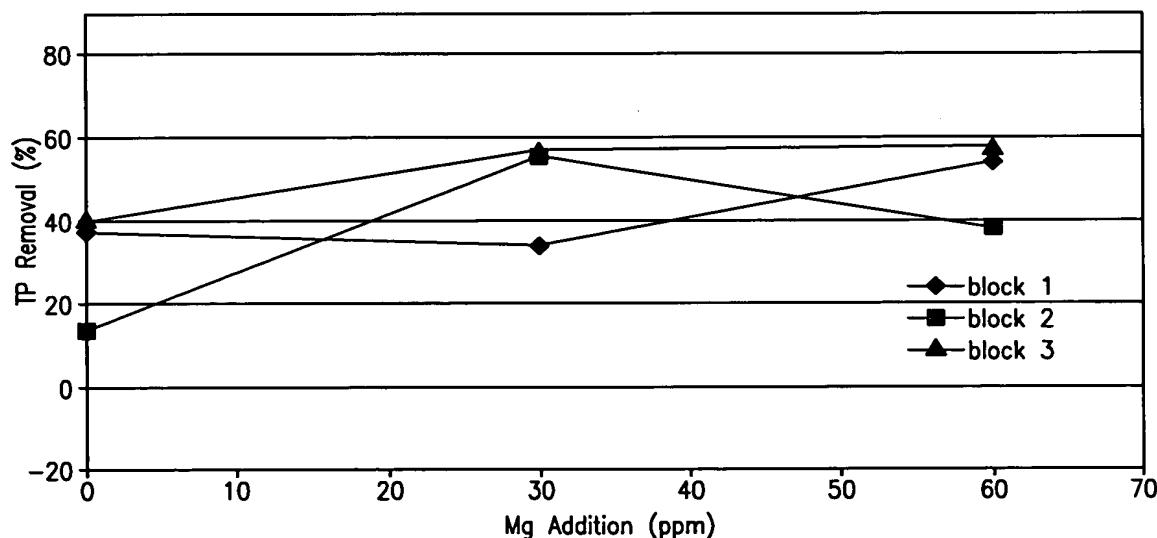
Title: APPARATUS AND METHOD FOR
REMOVING PHOSPHORUS FROM
WASTE LAGOON EFFLUENT

Applicant: Bowers et al.
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MVRs: TP Removal (%) vs. Mg Addition (ppm) with 100 ppm
(as TAN) Ammonia and 41.2 L/h Flow

FIG. 31



MVRs: TP Removal (%) vs. Mg Addition (ppm) with 200 ppm (as
TAN) Ammonia and 41.2 L/h Flow

FIG. 32

Title: APPARATUS AND METHOD FOR
REMOVING PHOSPHORUS FROM
WASTE LAGOON EFFLUENT
Applicant: Bowers et al.
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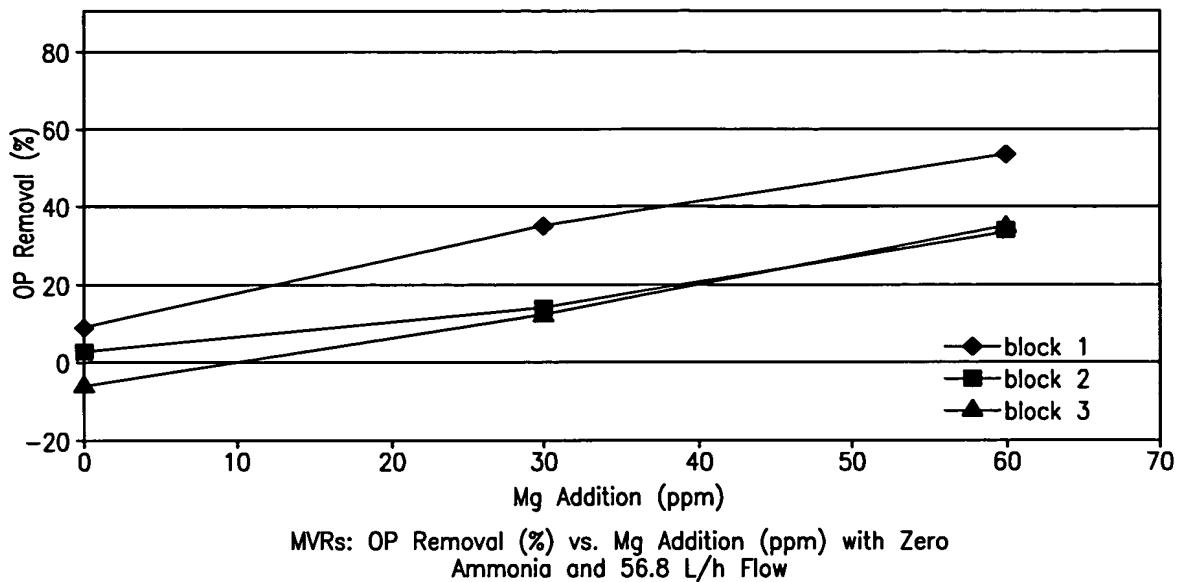


FIG. 33

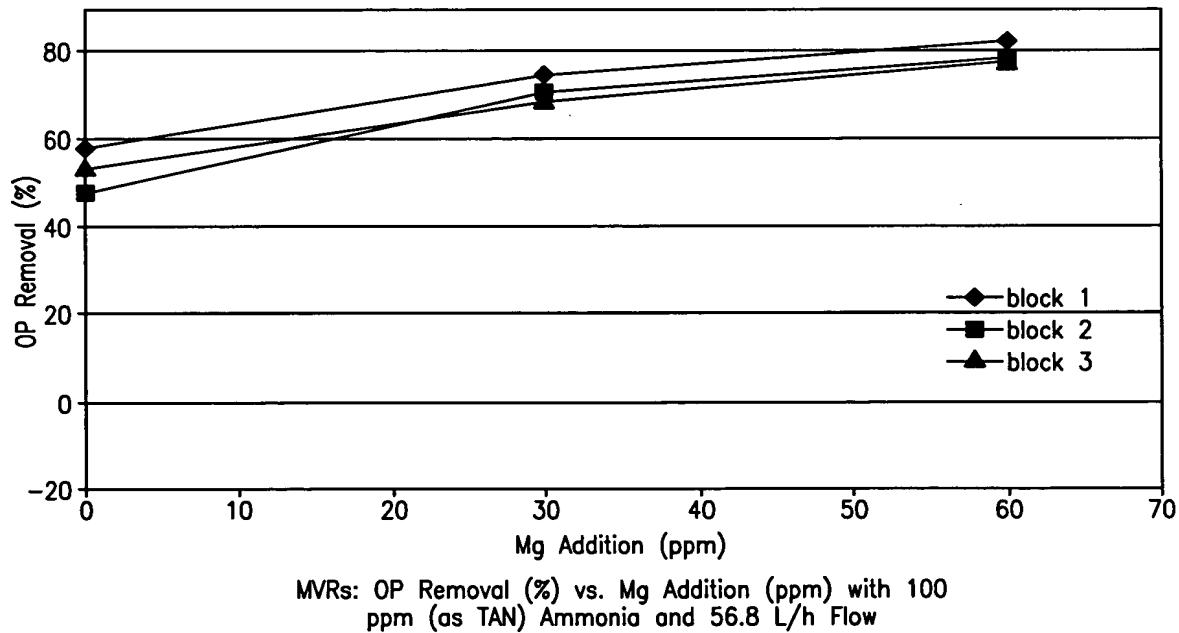


FIG. 34

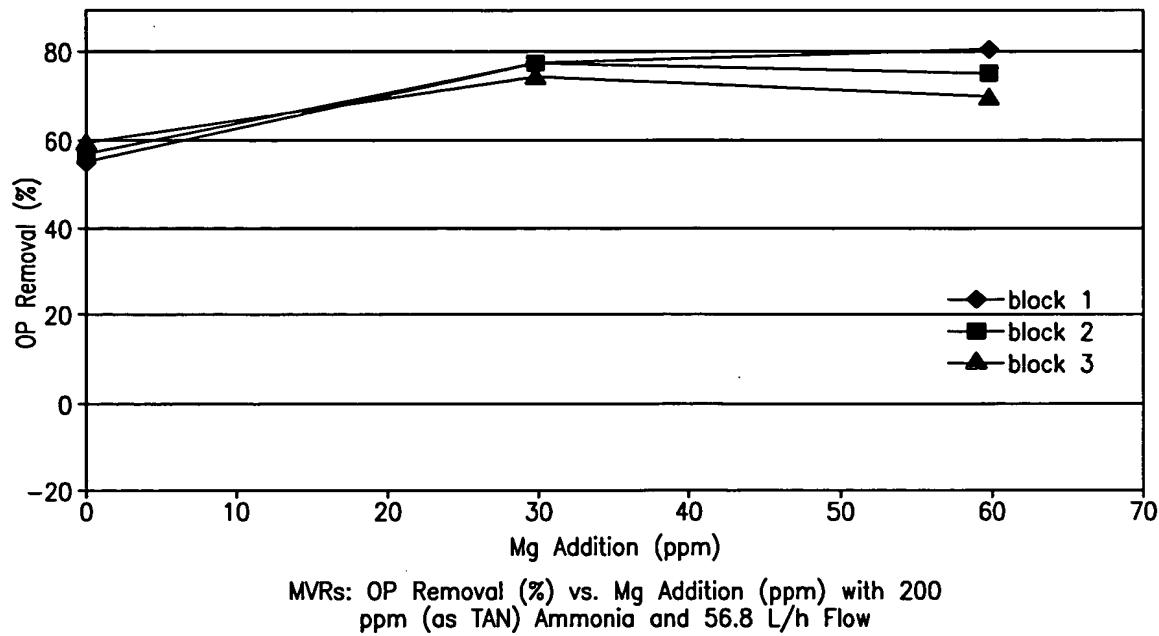


FIG. 35

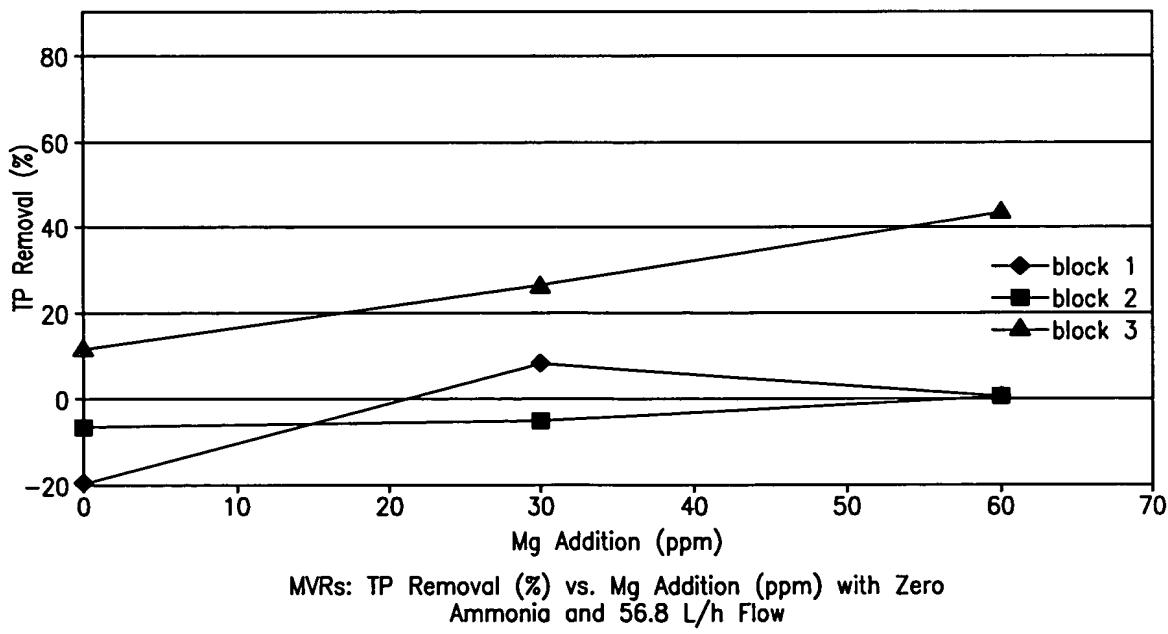


FIG. 36

Title: APPARATUS AND METHOD FOR
REMOVING PHOSPHORUS FROM
WASTE LAGOON EFFLUENT

Applicant: Bowers et al.
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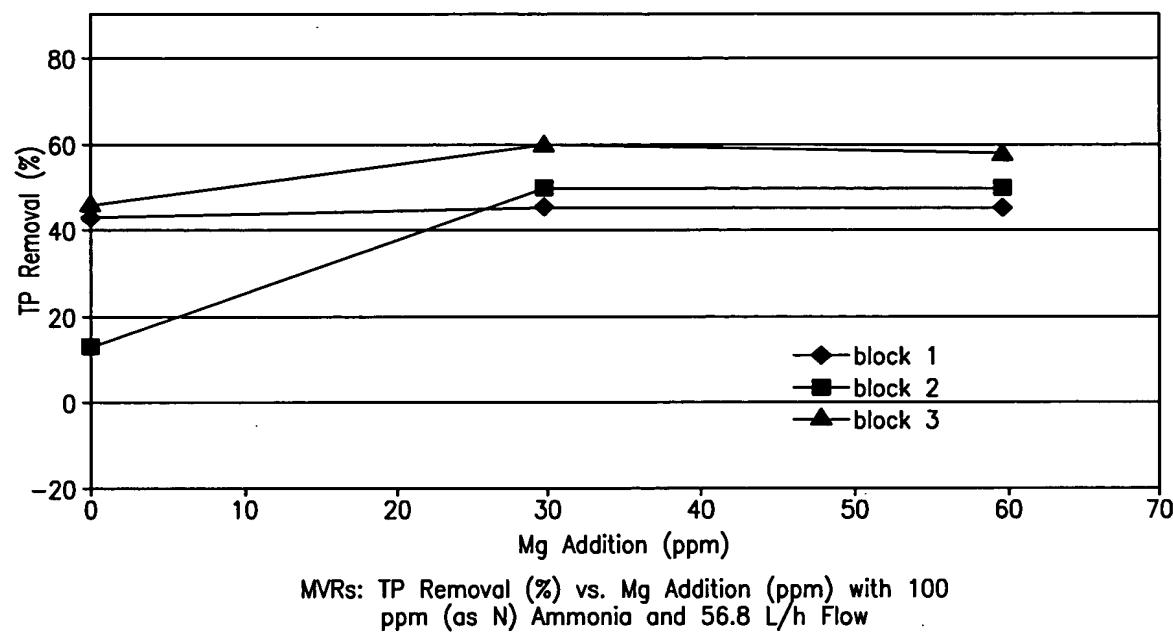


FIG. 37

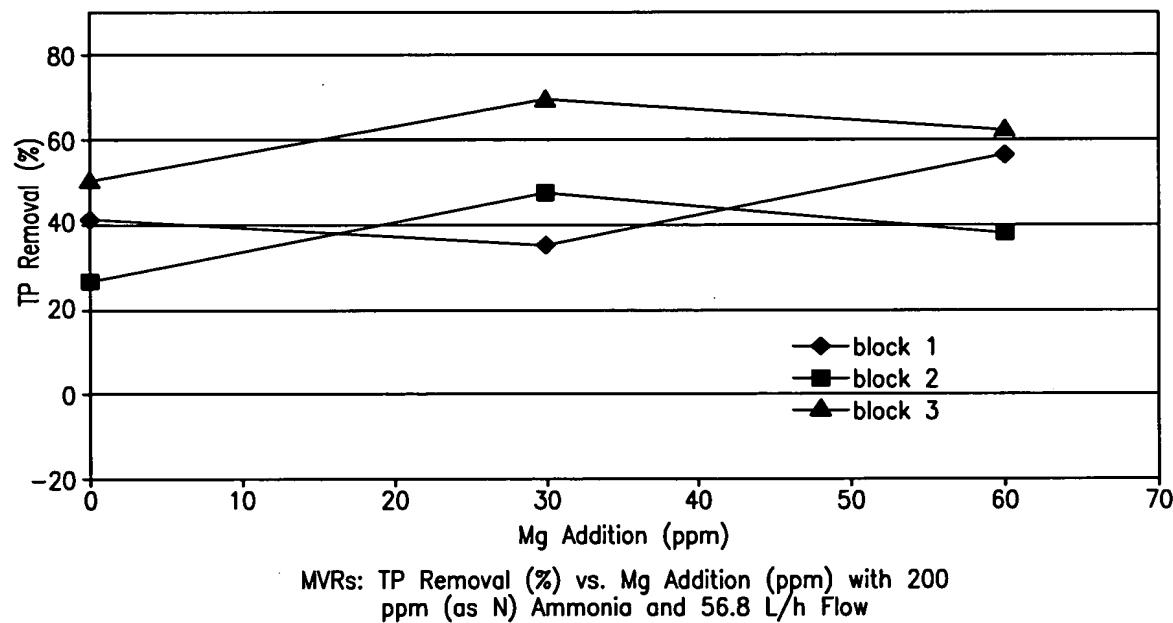


FIG. 38

Title: APPARATUS AND METHOD FOR
REMOVING PHOSPHORUS FROM
WASTE LAGOON EFFLUENT

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Atty Docket: 297/181

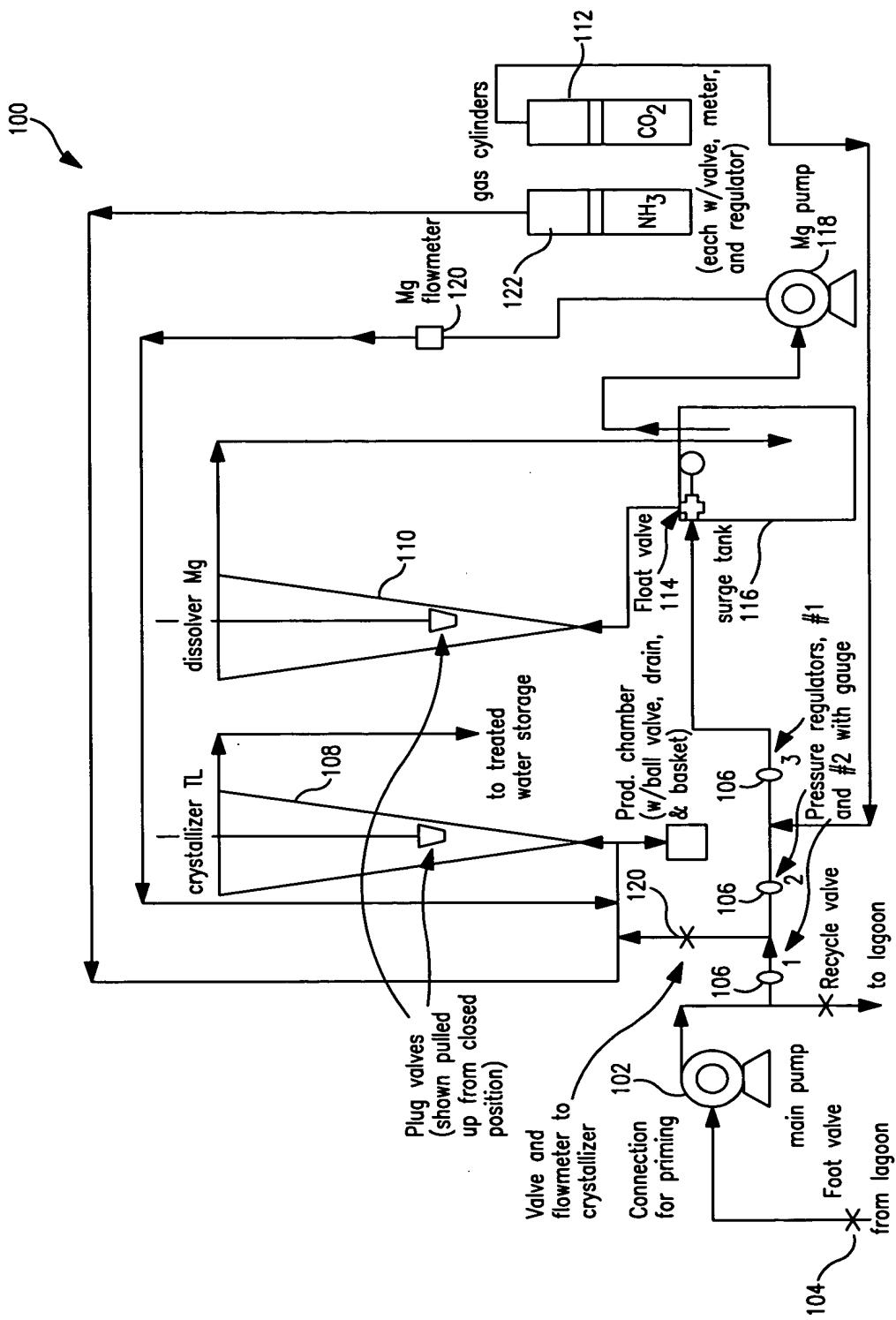


FIG. 39

Schematic Representation of Field-Scale Crystallizer, Showing Principal Components

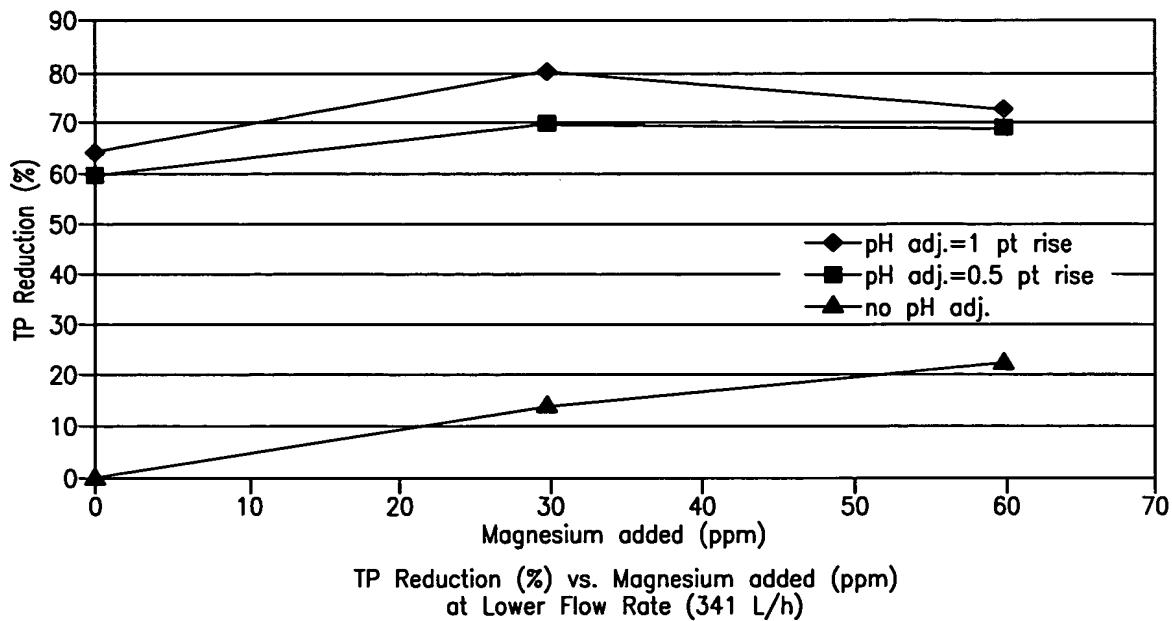


FIG. 40

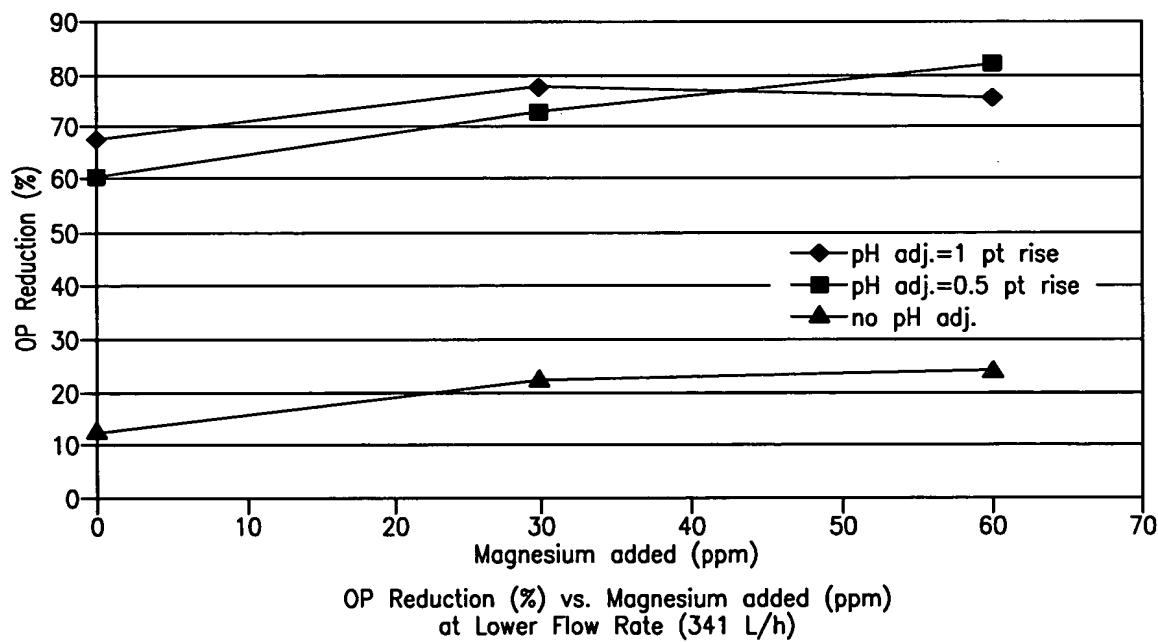


FIG. 41

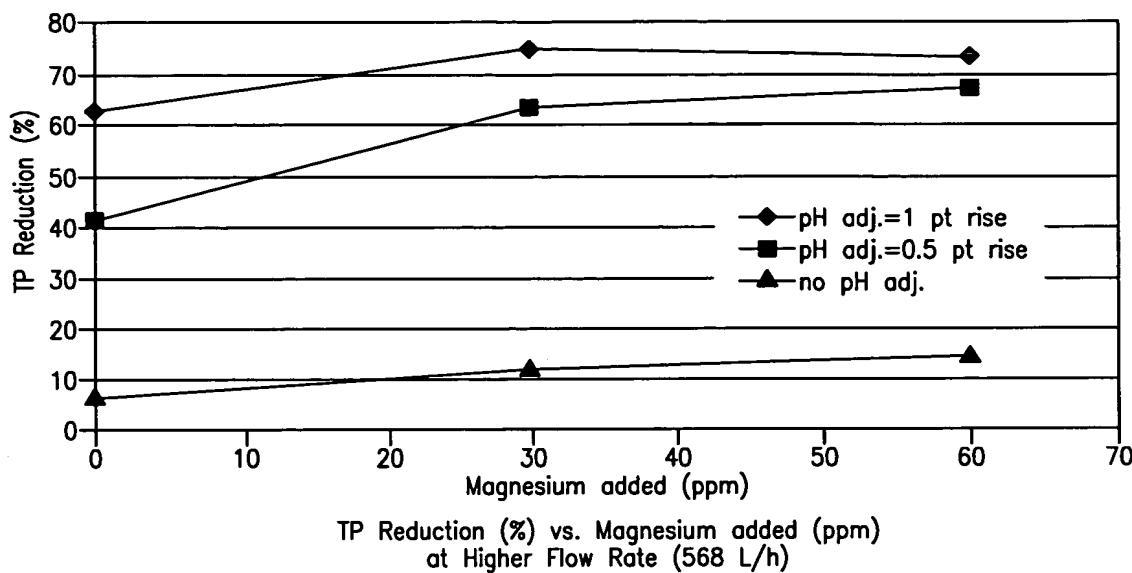


FIG. 42

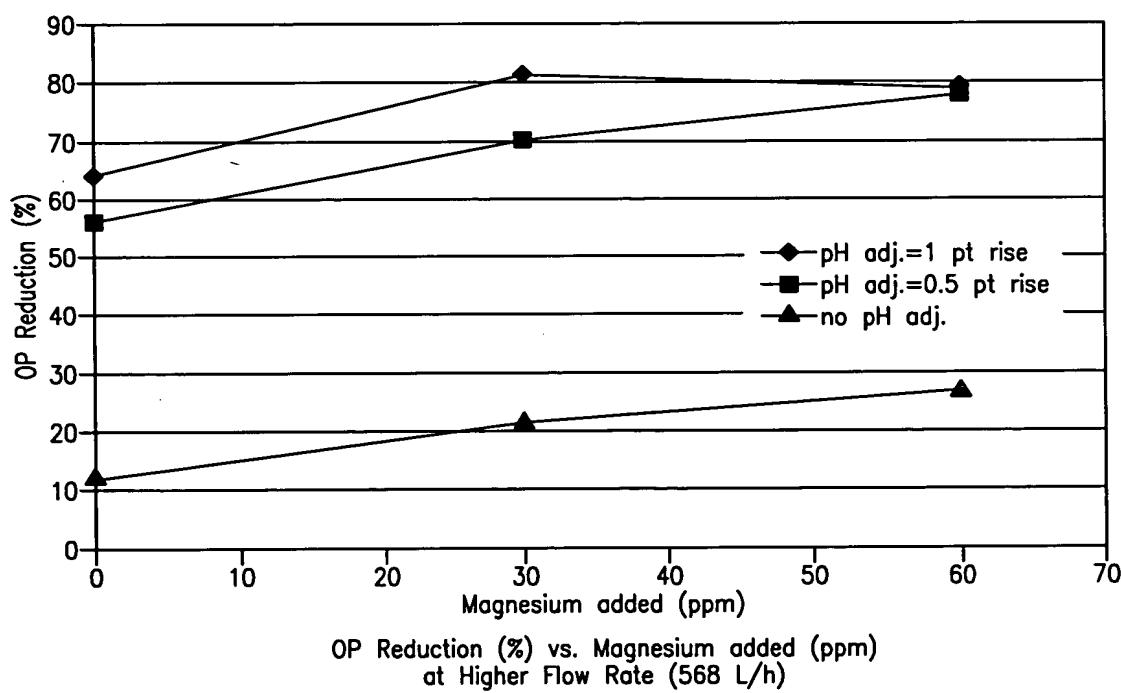


FIG. 43